Heat/Energy Recovery Ventilation Notes

1. A Heat/Energy Recovery Ventilation system should be installed in this house. The H./E.R.V. system provides ventilation, reclaims heat/energy from the exhaust stream by transferring heat/energy to the incoming air, & helps w/ heat distribution. This system in conjunction w/ a tight & well insulated building envelope should allow efficient heating w/ electric resistance units installed in every living space or a ductless heat pump unit. It is recommended that electric units be located in the ceilings to not interfere w/ room layouts/door swings. For a two story house it is recommended that a ductless unit utilize 2 (or more depending on the size of the house) indoor units (heads) installed in open areas of the house. One head should be located on the Main Floor & another on the Upper Floor. The idea being that the upper unit is used for cooling in the Summer & the lower unit for heating in the Winter. This should create natural air convection currents in the house & combined with the H./E.R.V. system should de-stratify the air in the house. These same principles can be used in vaulted one story houses as well.
2. The H./E.R.V. system should draw stale return air from bathrooms, kitchens, utility, or any other room that requires a vent fan & introduce new fresh air into living spaces. As a result bathroom fans are not required or recommended when using this system. Many Heat/Energy Recovery Ventilation manufacturers sell optional "boost" switches which may be installed in bathrooms or anywhere in the house to allow occupants to increase the cfm of the unit for a user determined amount of time. These units also may be equipped with humidistats to increase airflow when increased humidity is detected.
3. The H./E.R.V. unit should be calibrated to produce the air changes per hour recommended by code. Running the unit on an hourly timer is acceptable if running it continuously on its lowest CFM setting would result in over ventilating. However, the unit must be connected to switches that would allow the unit to be turned on in areas that need to be ventilated. A Blower Door Test should be performed & any air leaks in the building shell should be corrected before calibration.
4. The designer recommends installing the RecoupAerator 200DX ERV by UltimateAir or a properly sized/designed system produced by Zehnder. These are recommended because of their efficiency & low electrical draw. Zehnder makes more than one H./E.R.V. that may be used in this residence. Additionally, they have a unique duct & manifold system that uses ducts known as ComfoTubes. These ducts & manifold should be available for use with any H./E.R.V. The manifold may also be constructed on site by the HVAC contractor. Furthermore, Zehnder has sleek integrated thermostat controls & additional devices that can be installed with their systems that can increase functionality (UltimateAir also has additional devices).
5. Installing air inlets near heat sources is recommended to temper the return air. Installing air transfer grilles or "jump" ducts is recommended in ventilated rooms w/ doors even if doors are undercut. Otherwise leaving doors open may be necessary to maintain consistent room to room temperatures & system pressures.
6. All H./E.R.V. ducting should be pressure tested. All ducting in unconditioned spaces should be insulated to R-15+ unless it is impractical to do so. In that case it should be insulated to the highest R-value practical.
7. Provide adequate Makeup/Combustion air for all fuel burning & venting appliances including fireplaces, range hoods/down draft ranges >150 cfm, & dryers to eliminate backdrafting & for proper functioning of appliances.
8. The nearest Zehnder America rep & systems designer is Matt Groves. He is located in Southwest Washington/Northwest Oregon. His phone number is (360) 571-8060.
9. Visit www.UltimateAir.com for contact information for the RecoupAerator 200DX ERV.

Additional Energy Efficiency Notes

1. Visit www.ConservationTechnology.com to find energy efficiency products specified for this project. Many types of EPDM gaskets are available from Conservation Technology. ***ALL*** gaskets referred to in these plans are to be made of EPDM.
2. All penetrations between conditioned & unconditioned spaces must be air sealed. This includes but is not limited to plumbing/electrical penetrations through the subfloor into the crawlspace & through ceilings into the attic spaces.
3. Ceiling lighting penetrations into unconditioned spaces (Attics) must be air sealed as noted in note #2 above. There are many ways to do this & examples are available from the designer upon request. Insulation Contact rated fixtures are recommended if not required. For all lighting penetrations but specifically for can lights one method that has been used for many years calls for installing a sealed plywood box over the penetrations. The box is then caulked or foamed to the drywall. A simpler/better/cheaper solution that has been suggested is to use insulated flat foam bait buckets such as those produced by Frabil (www.Frabil.com) which can be foamed or caulked in place. They cost only a few dollars & are a quick/easy long term solution to leaky ceiling penetrations. Air tight light fixtures & trim kits are not a solution because their effectiveness is at best mediocre. Additionally, with air tight light fixtures care must be taken to air seal the fixture connection to the drywall. The bucket solution negates this requirement all together. Insulation can then be blown over the top of the bucket.

Additional Window Notes

1. All glazing should be specialized for its particular orientation to the sun. Depending on the adequacy of the shading provided for summer sun positions: generally South facing glazing should permit solar heat gain, North facing should have the lowest U-value practical (due to no/little possibility of solar heat gain), East facing should permit solar heat gain, & West facing may permit some solar heat gain.
2. Regardless of orientation if a window will be shaded by a covered porch, veranda, tree, etc. & will have little/no opportunity for solar heat gain it should be treated as a North facing window & should have the lowest U-value practical.
3. All windows shall have Low-E glass & Argon gas unless otherwise noted. See WSEC/NAQ Compliance form for further information prior to ordering windows. Note that the window U-values submitted on the Compliance form are MAXIMUMS & better performance is desired if possible. See below for specific window performance information.
4. Specific window performance information:
   Vertical windows should be designed to maximize inhabitant comfort in areas of high use/occupancy, but in areas of low use/occupancy cost may be more important. This means that the Living Room, Nook, & Dining Room should have the best insulated windows (U-value ≤0.20) in the residence, but the Bedrooms, Utility, Etc. ***may*** (not "should" or "must") have less efficient windows to mitigate the cost of the well insulated ones. The window package (including doors w/ >50% glass or as required by code/building department, but not including overhead windows) is to have a ***weighted U-value*** of ***≤0.25***. No window (except overhead & glass doors) may have a U-value >0.28.
   Overhead windows over conditioned space are to have U-values ≤0.40 (Wasco Skylights of Wells, Maine makes a skylight w/ a U-value of 0.30).
   Visual Transmittance values >0.50 for all glazing are recommended, but not required. High VT is desired, but should come after U-value in importance.
   Solar Heat Gain Coefficient values may vary depending on the shading, orientation to the sun, how much solar heat gain is desired, etc. The residence will be located in a heating climate & therefore should generally permit solar heat gain. If the residence is located so the Nook & Master Bedroom windows are facing South or near South the windows have the possibility of permitting undesirable solar heat gain during the hottest part of the Summer (the solar heat gain during the rest of year would be beneficial). However, the garage (@ Nook) & roof overhangs should limit the problem sufficiently so that no special low SHGC windows should be necessary. Interior/Exterior blinds or other shading devices should be enough to limit SHG during this short time period. SHGC is the least important factor of the three (U-value, VT, & then SHGC) for this residence.

Insulation Notes

1. ***All Insulation*** is to be blown in cellulose if possible. If situations arise in which blown in is not possible & a batt product is needed ***do not*** install fiberglass batts. Instead install Roxul rock wool insulation for its increased air impermeability, improved fit, & environmental friendliness over fiberglass. Blown in cellulose insulation is superior to batt fiberglass in fit, resistance to air movement, & r-value stability. Blown in fiberglass will also typically outperform batts in fit but not in r-value stability or resistance to air movement even if dense packed (although dense packing does improve its resistance to air movement somewhat). The r-value of fiberglass drops as outdoor temperatures decline, but cellulose does not. Therefore, installing cellulose insulation to code levels should result in improved energy efficiency over the same levels of fiberglass batt or blown in insulation. Exceeding code minimums w/ cellulose or any blown in product is also easily achieved in attic spaces relatively inexpensively.
2. "Dense packed" insulation installation methods should be used wherever possible. "Dense packed" insulation is to be defined as a ***minimum*** installed density of 3.5 pcf or per manufacturers specifications. At no time should it obstruct the installation or otherwise cause the failure of gypsum wall board placed in contact with it due to pressure. All insulated cavities receiving a gypsum wall board facing must be rolled flush to framing members.
3. All cavity installations must be dense packed to ***ensure*** no settling occurs. This includes walls, ***sloped*** ceilings, & floor system cavities. See manufacturers specifications & building codes for maximum slope for loose fill installation. Local codes (Washington/Mason County) appear only to allow loose fill installations up to a slope of 3:12. Check w/ code officials if installing on larger slopes is permissible if manufacturers specifications allow.
4. One method for increasing the speed of dense packing open wall systems such as the inner double wall in this residence (the stud bays are not segregated allowing insulation to flow into the adjacent stud bay) is to bulk fill with a larger hose diameter. After the wall is full of low density cellulose a smaller dense packing hose can be inserted to dense pack the walls.

NOTES:
ALL MAN DOORS & OPENINGS TO BE 36" WIDE UNLESS OTHERWISE NOTED.

GAS INSERT, HEARTH, BACKWALL, & STONE VENEER INSTALLED PER CODE & MNFR. SPECS.-VERIFY HEARTH HT. W/ OWNER & MODIFY @ WINDOW IF NECESSARY-T.V. & EQUIPMENT TO BE LOCATED ABOVE MANTLE IN A RECESS.

CONSIDER INSTALLING SMOKE DETECTORS HIGH ON WALLS & USING WALL MOUNTED LIGHTING INSTEAD OF CEILING MOUNTED TO LIMIT CEILING PENETRATIONS.

VERIFY HOSE BIBB LOCATIONS W/ OWNER PRIOR TO INSTALLATION.

MASTER BATH HOT WATER RECOMENDATION:
INSTALL A SWITCHED HOT WATER CIRCULATION PUMP THAT CAN BE SWITCHED ON/OFF BY OWNER AS NEEDED DUE TO THE DISTANCE FROM THE HOT WATER SUPPLY. IT SHOULD NOT BE ALLOWED TO RUN CONTINUOUSLY OR ON A TIMER.

WINDOW NOTES:
ALL VERTICALLY SLIDING (SINGLE HUNG) WINDOWS (DENOTED AS "V.S.") ARE TO HAVE RAISED BAR SETS (TOP & BOTTOM GLAZING UNITS ARE NOT EQUAL IN HEIGHT). THE TOP GLAZING UNIT IS TO BE 24"± TALL. SEE ADDITIONAL WINDOW NOTES & BELOW FOR ADDITIONAL SPECIFICATIONS.

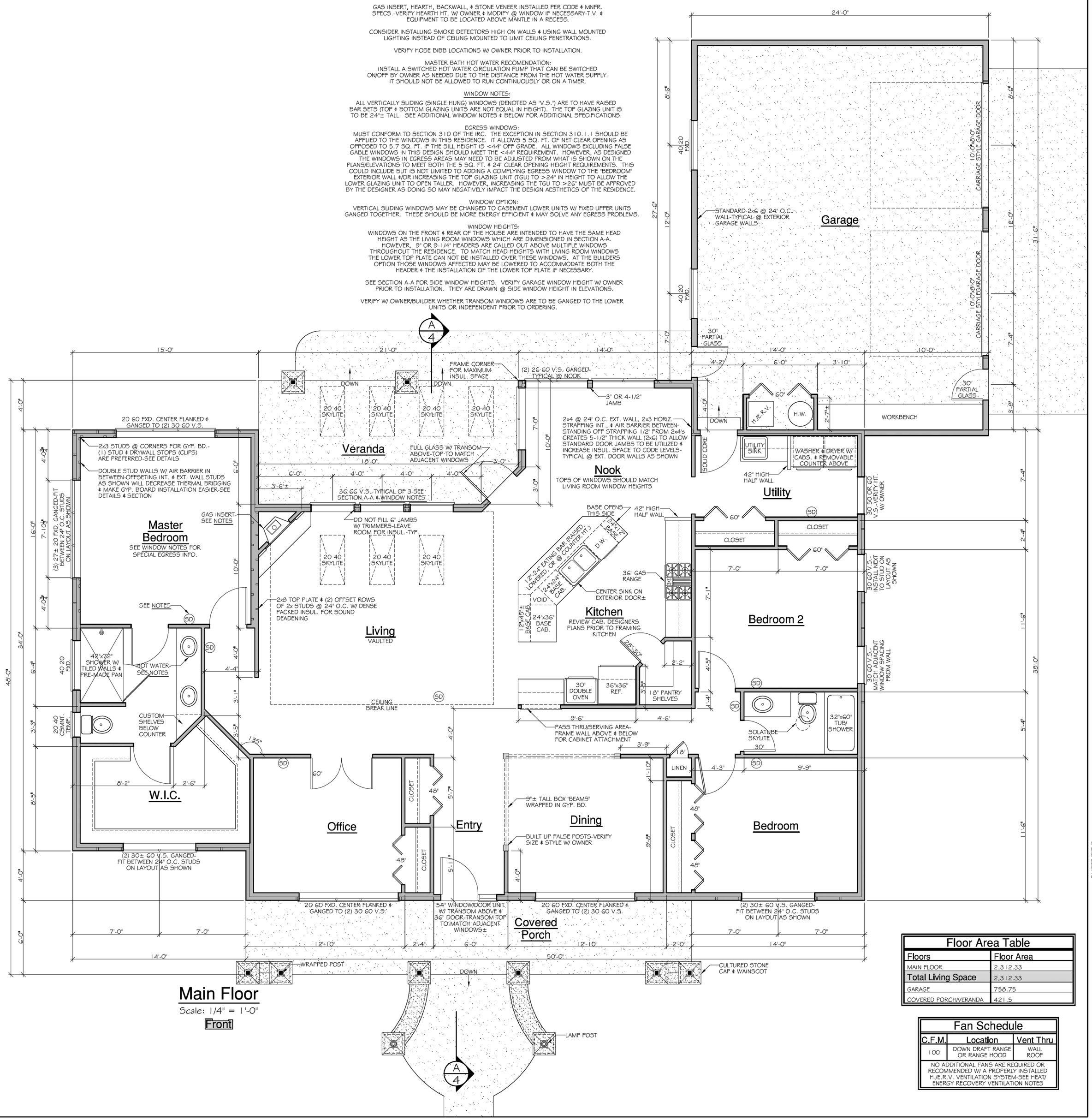
EGRESS WINDOWS:
MUST CONFORM TO SECTION 310 OF THE IRC. THE EXCEPTION IN SECTION 310.1.1 SHOULD BE APPLIED TO THE WINDOWS IN THIS RESIDENCE. IT ALLOWS 5 SQ. FT. OF NET CLEAR OPENING AS OPPOSED TO 5.7 SQ. FT. IF THE SILL HEIGHT IS <44" OFF GRADE. ALL WINDOWS EXCLUDING FALSE GABLE WINDOWS IN THIS DESIGN SHOULD MEET THE <44" REQUIREMENT. HOWEVER, AS DESIGNED THE WINDOWS IN EGRESS AREAS MAY NEED TO BE ADJUSTED FROM WHAT IS SHOWN ON THE PLANS/ELEVATIONS TO MEET BOTH THE 5 SQ. FT. & 24" CLEAR OPENING HEIGHT REQUIREMENTS. THIS COULD INCLUDE BUT IS NOT LIMITED TO ADDING A COMPLYING EGRESS WINDOW TO THE "BEDROOM" EXTERIOR WALL & /OR INCREASING THE TOP GLAZING UNIT (TGU) TO >24" IN HEIGHT TO ALLOW THE LOWER GLAZING UNIT TO OPEN TALLER. HOWEVER, INCREASING THE TGU TO >26" MUST BE APPROVED BY THE DESIGNER AS DOING SO MAY NEGATIVELY IMPACT THE DESIGN AESTHETICS OF THE RESIDENCE.

WINDOW OPTION:
VERTICAL SLIDING WINDOWS MAY BE CHANGED TO CASEMENT LOWER UNITS W/ FIXED UPPER UNITS GANGED TOGETHER. THESE SHOULD BE MORE ENERGY EFFICIENT & MAY SOLVE ANY EGRESS PROBLEMS.

WINDOW HEIGHTS:
WINDOWS ON THE FRONT & REAR OF THE HOUSE ARE INTENDED TO HAVE THE SAME HEAD HEIGHT AS THE LIVING ROOM WINDOWS WHICH ARE DIMENSIONED IN SECTION A-A. HOWEVER, 9' OR 9-1/4" HEADERS ARE CALLED OUT ABOVE MULTIPLE WINDOWS THROUGHOUT THE RESIDENCE. TO MATCH HEAD HEIGHTS WITH LIVING ROOM WINDOWS THE LOWER TOP PLATE CAN NOT BE INSTALLED OVER THESE WINDOWS. AT THE BUILDERS OPTION THOSE WINDOWS AFFECTED MAY BE LOWERED TO ACCOMMODATE BOTH THE HEADER & THE INSTALLATION OF THE LOWER TOP PLATE IF NECESSARY.

SEE SECTION A-A FOR SIDE WINDOW HEIGHTS. VERIFY GARAGE WINDOW HEIGHT W/ OWNER PRIOR TO INSTALLATION. THEY ARE DRAWN @ SIDE WINDOW HEIGHT IN ELEVATIONS.

VERIFY W/ OWNER/BUILDER WHETHER TRANSOM WINDOWS ARE TO BE GANGED TO THE LOWER UNITS OR INDEPENDENT PRIOR TO ORDERING.



Main Floor

Scale: 1/4" = 1'-0"

Floor Area Table	
Floors	Floor Area
MAIN FLOOR	2,312.33
Total Living Space	2,312.33
GARAGE	756.75
COVERED PORCH/VERANDA	421.5

Fan Schedule		
C.F.M.	Location	Vent Thru
100	DOWN DRAFT RANGE OR RANGE HOOD	WALL ROOF
NO ADDITIONAL FANS ARE REQUIRED OR RECOMMENDED W/ A PROPERLY INSTALLED H./E.R.V. VENTILATION SYSTEM-SEE HEAT/ENERGY RECOVERY VENTILATION NOTES		

Cair Paravel Design
561 E Eagle Ridge Dr
Shelton, WA 98584
360-490-6323
CPDesign@Juno.com

REVISIONS
DATE:

Frank & Janice Pascher
250 E Rock Way
Shelton, WA 98584
(360) 426-3105

SHEET TITLE:
Additional Notes & Main Floor Plan

SHEET DATA
DRAWN BY: Spencer Bumfield
CHECKED BY: Spencer Bumfield
DATE: March 8th, 2012
ENGINEERS NUMBER:
DESIGNERS NUMBER: 2011-08-09-Pascher

SHEET ID
3
Of 4